Attachment 1: Description of Emission Reduction Measure Form

Please fill out one form for each emission reduction measure. See instructions in Attachment 2.

Title: Update Heavy-Duty Vehicle Idling Regulation to reguire GHG reductions

Type of Measure (check all that apply):

☒ Direct Regulation ☐ Market-Based Compliance
☐ Monetary Incentive ☐ Non-Monetary Incentive
☐ Voluntary ☐ Alternative Compliance Mechanism
☐ Other Describe:

Responsible Agency: ARB

Sector:

☒ Transportation ☐ Electricity Generation
☐ Other Industrial ☐ Refineries
☐ Agriculture ☐ Cement
☐ Sequestration ☐ Other Describe:

2020 Baseline Emissions Assumed (MMT CO2E): 1.2 MMTCO2E

Percent Reduction in 2020: 88%, or 1 MMTCO2E

Cost-Effectiveness ($/metric ton CO2E) in 2020: The cost-effectiveness of this measure will likely be negative as is the case with the current assumptions of diesel fueled APU use. As zero emission technologies continue to advance and more truck stop electrification infrastructure is installed, costs of these alternatives will continue to be reduced. ARB estimated that battery electric devices had payback periods of 1 to 2.5 years [3].

Description: ARB should modifiy the existing regulation on heavy-duty diesel idling to include standards for greenhouse gas reductions.

The current diesel heavy-duty idling regulations allow the use of alternatives to main engine idling to reduce PM and NOX emissions. The regulations are not greenhouse gas regulations and do not guarantee reductions of CO2 or other GHG pollutants. For example, an alternative to using an auxiliary power unit (APU) or other alternative idling device is to certify the main engine to NOx and PM idling standards. Should this become a common compliance mechanism, there will be little CO2 emission beneifts for the regulation. In addition, diesel powered APU's are not the lowest GHG emitting

options available, but there is no incentive or requirement in the current regulation to use lower GHG options.

ARB should develop greenhouse gas criteria as part of the heavy-duty idling regulations to ensure that the lowest greenhouse gas emitting technologies are used in place of idling the main diesel engine. Doing so will at a minimum ensure that greenhouse gas benefits ARB already expects from the rule are realized, and could achieve even greater GHG reductions by setting appropriate GHG criteria . Zero emission idling requirements should be considered along with increased truck stop electrification programs.

Emission Reduction Calculations and Assumptions:
BASELINE
The initial statement of reasons (ISOR) for the heav-duty idling regulation estimates that in 2020, C02 emission from sleeper cabs will be 3550 tons of CO_2 per day. This is equivalent to 1.2 MMTCO2E.

BENEFITS
According to the staff report for the Heavy-Duty Idling Regulation [3], the average power load for a cab during sleep period is 2.7 kw.

Providing this load using the main engine results in an emission rate of 6228 g/hour of CO_2. Alternatively using a diesel fuel APU has an emission rate of 2228 grams/hour. This difference in emission rates results in the 2020 estimate of a 64% decrease in GHG from all trucks opting to use a diesel fueld APU. This 64% is not guaranteed with the current regulation allowing optional NOx standard certification of main engines.

Using zero emission technologies, rather than diesel fueled APU, will lower the CO_2 emission rate even further. For this analysis we assume that zero emission technologies rely on the California electric grid to power cab comfort requirements. Using California electricity emission rates, the CO_2 emission for one hour servicing a load of 2.7 kw is 742 g/hour. This amounts to a 67% reduction over a diesel APU, and an 88% reduction over main engine idling.

Total potential benefit of reducing main engine sleeper cab idling using zero emission technologies could be as high as 88% or 1 MMTCO2E annual reductions by 2020.

Constants
Global Warming Potential (GWP)
CO_2 = 1
CH_4 = 21
N_2O = 310

California Electricity Emission Factors [1]
CO_2 275g/kwh CO2E

CH4   .0067 lbs/MWh = .00305 g/kwh = .064 g/kwh CO2E
N20   .0037 lbs/MWh = .00168 g/kwh = .0123 g/kwh CO2E

Sources:
[1] US Department of Energy, Energy Information Agency. "Average Electricity Emission Factors by State and Region", 2002. http://www.eia.doe.gov/oiaf/1605/e-factor.html
[2] IPCC (1996). Second Assessment Report. Climate Change 1995: WG I - The Science of Climate Change. Intergovernmental Panel on Climate Change; J.T. Houghton, L.G. Meira Filho, B.A. Callander, N. Harris, A. Kattenberg, and K. Maskell (eds.); Cambridge University Press. Cambridge, U.K.
[3] Air Resources Board, Initial Statement of Reasons: NOTICE OF PUBLIC HEARING TO CONSIDER REQUIREMENTS TO REDUCE IDLING EMISSIONS FROM NEW AND IN-USE TRUCKS, BEGINNING IN 2008, September 2005.

Cost-Effectiveness Calculation and Assumptions: Staff analysis in 2005 found that idling solutions pay for themselves in 6 months to 2.5 years, including battery electric options.

Implementation Barriers and Ways to Overcome Them:

Potential Impact on Criteria and Toxic Pollutants: Using zero emission technologies to reduce overnight idling of heavy-duty trucks will eliminate tailpipe criteria pollutants - furthering the benefits of the orginal regulation.

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